

it should be obeyed. The view more generally taken was that, since the civic control was becoming daily more vested in the popular vote, it was desirable for the British Association to emphasise the responsibility which rested upon the public to acquaint themselves with matters connected with the public health, and to put the most trustworthy information before them in the most open way.

Amongst the more technical communications there were two excellent ones by Drs. Nasmith and Graham, of Toronto, on the hæmatology of carbon monoxide poisoning, and by Dr. Dawson Turner on the electrical resistance of the tissues. Both communications were the result of much laborious research; their interest lay along the more strictly medical line.

JOSEPH BARCROFT.

LOCAL SOCIETIES AT THE BRITISH ASSOCIATION.

THIS conference was presided over by Sir Edward Brabrook, C.B., who fitly represented those societies which have recently been brought into relationship with the British Association under the title of "Associated Societies." These comprise such local bodies as exist for the encouragement of the study of science, but are not at present in a position to undertake and publish original investigations. The chairman, in opening the proceedings, dwelt on the useful work which these modest societies might accomplish, and suggested various ways in which local societies, whether belonging to the affiliated or to the associated class, might aid those sections of the British Association in which he was specially interested, namely, the sections of anthropology, economics, and educational science.

Dr. H. R. Mill delivered an address on local societies and meteorology, in which he commended the study of this science as peculiarly suitable for cultivation by the corresponding societies. Local climate can be determined only by a long, continuous record of local observations; and this continuity, so difficult to maintain by private observers, can be readily secured by a local society, which by its nature is, or should be, immortal. Sunshine and rainfall are two elements of climate which still need much further study. A vast body of meteorological observations in the past has been absolutely useless either because the instruments used were not trustworthy or the hours of observation were irregular; whilst in many cases the observations, otherwise of value, have lost their usefulness through not having been dealt with by competent authorities. In the course of a discussion, Mr. E. Kitto, the superintendent of the Falmouth Observatory, referred to the special value of the magnetic records regularly issued from his station. Dr. J. R. Ashworth, of Rochdale, pleaded for a meteorological survey of the British Islands—a work in which the local societies might obviously render material assistance.

The second meeting was presided over by Mr. J. Hopkinson, vice-chairman of the conference, who in his introductory remarks pointed out the great value of photographic surveys of counties. This subject was elaborately treated by Mr. W. Jerome Harrison, of Birmingham, in a communication on the desirability of promoting county photographic surveys. The paper gave a history of the movement, which was practically initiated by the author, and has spread from Warwickshire, where it was started, to several other counties, including Worcestershire, Essex, Surrey, and Kent. Mr. Harrison suggested that a committee should be formed to coordinate the photographic societies with the literary and scientific societies, so that all should join in the work of the surveys. The subject was warmly taken up by the delegates, and it was determined to apply, at next year's meeting, for the appointment of a county photo-survey committee. The Rev. Ashington Bullen suggested that at every meeting of the British Association there should be a photographic exhibition illustrating the archæology, ethnology, and natural history of the particular county in which the meeting was held. Prof. H. H. Turner referred to the value of pairs of photographs on the stereoscopic plan, inasmuch as they enabled the distances between various objects represented on them

to be ascertained by calculation. In the course of the discussion much approval was expressed of the work of those committees of the British Association which dealt with photography as applied to geology, anthropology, and botany.

THE BOMBAY LOCUST.¹

ANOTHER new venture among Indian memoirs has lately been issued, and if subsequent numbers are like this first instalment they will prove of great value. Mr. Maxwell-Lefroy deals in this first issue with the Bombay locust; we prefer to call it by its popular name, for its scientific one seems in doubt. Specimens were sent by Mr. Lefroy, and have been named at the British Museum by Mr. Kirby as *Acridium rubescens*, Walker, which is apparently quite correct; but we learn from this report that Mr. de Saussure assigns the Bombay locust to Linnaeus's species *Acridium succinctum*. In this report the latter name is chosen as probably being most accurate, but it is extremely doubtful if Mr. Lefroy has made the right choice. It is best, therefore, as "doctors disagree," to call this pest simply the Bombay locust.

The work comprises 109 pages of letterpress and thirteen plates, the latter being an improvement on the majority we see from India. The report deals with investigations made in 1903-4, and contains an amount of useful information concerning "locust swarms."

Part i. is devoted to the subject of the formation and movements of locust swarms. In it the author shows and explains how a swarm arises, how from grasses in which they were concealed they entered the crops and "gradually formed into swarms and moved over the country-side." Then these definite bodies of locusts could be traced from village to village. Later they were shown to move in definite directions, migrating at nights, when their wings were constantly and suddenly seen glistening against the moon as they flew by, and as suddenly they vanished.

These swarms settled in the forest regions at last during November and December, and then in March and April a second or outward migration was traced. After the outward migration the swarms were shown to break up, and only scattered locusts could be found. A vast area of land thus became infested with them, but little or no damage was done, for "the locusts had apparently lost the swarming and migrating instinct." Reproduction then set in.

The summary given is as follows:—

Winged locusts emerged and entered crops	... Oct. 1-20.
" " migrated	... Oct. 20-Nov. 30.
" " remained in forests	... Dec. 1-March 20.
" " migrated	... March 20-May 20.
" " scattered	... May 20-June 10.
" " reproduced and died	... June 10-Aug. 10.

In part ii. Mr. Lefroy deals with the life-history of this locust, giving an account of the egg-laying, hatching, development, and the description of the "hoppers" after each moult.

In part iii. are related the habits of locusts and methods employed for their destruction. The first is dealt with in a clear and interesting manner, and is well worth the study of anyone engaged in locust work.

The rewards given for collecting this pest and its eggs varied, but during cold weather winged locusts were paid for at the rate of $\frac{1}{4}$ to $\frac{1}{2}$ anna per seer (2 lb.), and this pay was sufficient to give a fair wage to an active man. Later 4 annas were paid per seer, a seer containing 400 to 450 locusts. Amongst natural enemies mentioned we notice monkeys, the striped squirrel and the grey-necked crow, and several insects. No doubt these all do some good, but to rely on them to prevent locust swarms is futile. Amongst methods of destroying these noxious insects is the employment of poisoned baits. Experiments recorded here show that a weak solution of arsenate of lead proved better than a strong solution of sodium arsenate or the well-known Natal locust mixture. More than 80 per cent. of the locusts were killed when fodder baits were sprayed with 1 lb. of lead arsenate, and 5 lb. of jaggery, to 100 gallons of water, in twelve hours. For

¹ "Memoirs of the Department of Agriculture in India." Vol. i., No. 1. By H. Maxwell-Lefroy. (Calcutta, April, 1906.) Price Rs. 2.8.

some reason the locusts would not touch the other poisoned baits.

The concluding part (v.) reviews the systematic position of the Bombay locust, and gives a useful list of other species found with it. These locusts are figured in the plates.

Half this report consists of four appendices. The first deals with the action taken against locusts in the Bombay Presidency. Summing up the campaign against the locust in 1904, it is made quite evident that a very determined effort was made to cope with this pest, and that the excellent organisation that extended to every village in the Presidency was effectual in producing a very general action on the part of the people. This is all the more remarkable when we consider the natural apathy of the ryot and his strong objection to take life of any kind. Yet we are told in the report that "4152 maunds of adults, equivalent to 66,432,000 individuals, were destroyed, or two-tenths of a per cent. of the estimated number." One hundred maunds of eggs were destroyed, representing 400,000,000 individuals, and 13,252 maunds of "hoppers," which represented some 530,000,000. That is, 930 millions of young were destroyed!

In all some 1500 millions were probably accounted for, including adults, eggs, and hoppers; of these 66 millions were adults, which would have been responsible for another 3000 million "hoppers" had they lived. To accomplish this the Bombay Government spent a little more than two lakhs in rewards. Anyone knowing what "locust swarms" mean to the cultivator will acknowledge that this sum was well spent. In the same appendix are notes on the latest invasion of the Portuguese territory of Goa, where the damage in 1904 was also very great. Fears were entertained that the locusts might make their way to the seaboard and destroy the magnificent paying cocoanut trees, one of the chief sources of revenue to the country.

The second appendix is by Mr. B. P. Standen. In it are mentioned various methods used to cope with the locusts, such as the American "hopper dozer," the Russian wheeled revolving brush, bags, poison bait, bonfires, &c. But in the end of all this Mr. Standen tells us (p. 92) that "the efforts were aided in a remarkable fashion by *juari* birds (the *Rosy Pastor*), which arrived in large flocks earlier than usual and devoured the locusts greedily." . . . "It is quite possible that the preservation of the crops was due as much to these birds as to the effects of human agency." Yet a few lines further back we are told in his report that the Deputy Commissioner of Wardha considered that a third of the total number of hoppers were destroyed by the measures adopted, whilst others estimated that half at least were destroyed.

Besides the plates of various species and structural peculiarities, there is also a map showing the infested area in 1903-4.

FRED. V. THEOBALD.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The second Frank Smart studentship in botany, tenable at Gonville and Caius College, has been awarded to Mr. F. T. Brooks, late scholar of Emmanuel College, the understanding being that the student shall prosecute research in some special branch of scientific forestry.

MR. SYDNEY PENNINGTON has been appointed an instructor in veterinary science in the School of Agriculture, Ghizeh, Egypt.

MR. J. BLAKEMAN, Trinity College, Cambridge, has been appointed mathematical master at the Municipal Technical School, Leicester.

THE results of the annual examination held last July by the Oxford and Cambridge Schools Examination Board have now been issued. The total number of candidates for higher certificates was 2054, of whom 462 were girls offering letters only. Of these candidates 1084 offered Latin, 882 Greek, and 1369 French. In natural philosophy

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there were 143 candidates in the mechanical division, 131 in the physical division, and 132 in the chemical division. Physical geography and geology were offered by forty candidates, and biology by 183. The total number of candidates for lower certificates was 1046, and the number of candidates offering the several subjects mentioned was as follows:—Latin, 668; Greek, 393; French, 993; mechanics and physics, 74; physics and chemistry, 235; chemistry and mechanics, 23; and botany, 62. The candidates in this examination are almost entirely from public schools, and the numbers given are interesting, since they indicate the relative importance attached to linguistic and scientific studies in these schools.

AMONG calendars which have been received recently, that of the East London College, in the Mile End Road, is of special interest, showing as it does the admirable provision now made in East London for higher education. The object of the college is to provide such instruction in the various branches of a liberal education as will qualify students to take degrees at the University of London and other universities of the United Kingdom; to give such instruction in science and technology as will be serviceable to students who intend to pursue a profession or trade in which a knowledge of science in its practical applications is required; and generally to promote higher education in East London. The engineering department and other portions of the college premises have been enlarged recently at the expense of the Drapers' Company, which has made a further grant of 5000*l.* for this purpose. This company is again awarding valuable scholarships tenable at the college. The staff, too, has been strengthened, and there is every prospect of a highly successful session's work.

THE London County Council has organised for the session 1906-7 courses of instruction for teachers. These courses are open without fee to teachers in London schools, and are intended to offer to teachers in the various types of schools opportunities for developing their knowledge of different subjects and of coming into contact with those who have made a special study of the subjects in question. The Council is of opinion that few things can be of greater assistance to teachers than personal contact with some experienced teacher who has devoted special attention to a particular subject, or has made a study of the best methods of presenting the subject to others. The courses include partly lectures and demonstrations in special subjects, such as manual training, general elementary science, physics, chemistry, botany, and also courses conducted under the auspices of the County Council at the schools of the university, namely, University College, King's College, Bedford College, and the London School of Economics and Political Science. Full particulars with regard to the courses may be obtained from the executive officer, Education Offices, London County Council, Victoria Embankment, W.C.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 24—Croonian Lecture, 1906.—"On Nerve Endings and on Special Excitable Substances in Cells." By Prof. J. N. Langley, F.R.S.

The author stated in his general conclusions that the paper had shown there was reason to believe that in each of the three great types of connection of the peripheral end of an efferent nerve with a cell, it is some constituent of the cell substance which is stimulated or paralysed by poison ordinarily taken as stimulating or paralysing nerve endings. Reasons, though less complete, have been given for supposing that these poisons have no special action on nerve endings, and that physiologically the nerve ending is not essentially different from the nerve fibre. In that case, not only the function of reacting to numerous chemical bodies, but probably also the special liability of both afferent and efferent nerves to fatigue must be transferred from the nerve endings to the same constituent of the cell.

This theory adds to the complexity of the cell. It necessitates the presence in it of one or more substances (receptive substances) which are capable of receiving and